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## **PERCEIVED QUALITY BY HIGHER EDUCATION STUDENTS: EFFECTS FROM CLASS SIZE, GENDER AND EXPERIENCE OF USE**

**QUALIDADE PERCEBIDA POR ALUNOS DE INSTITUIÇÕES DE ENSINO SUPERIOR: EFEITOS DO TAMANHO DA TURMA, GÊNERO E TEMPO DE EXPERIÊNCIA DO ALUNO**

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## ABSTRACT

This study intends to investigate the relationships between perceived quality in private Higher Education and class size, gender, and experience of use (i.e.: service consumption duration). Following a quantitative approach, a survey was employed to gather data from a sample of 1,379 students from three large Brazilian Higher Education Institutions (HEI). Results from a Mann-Whitney's U test indicate a significant negative relationship between perceived quality and class size. Additionally, senior students' perceived quality is significantly lower than first-year students' perceptions of service quality. On the other hand, although female's average perceptions showed higher results than male's in all quality dimensions, no significance between perceived quality and gender was detected. The study highlights the potential impact of relevant items on HEI's service perceived quality and consumer behavior debate by covering current academic gaps on some of the variables' relationships analyses. HEIs can use these findings to improve their future strategic decisions, including valuable inputs to face current and future challenges, such as the need for operational and financial improvements and the management of the complex balance between the class size trends and service's perceived quality.

**Keywords:** Perceived Quality. Service Consumption Duration. Gender. SERVPERF. Class Size.

## RESUMO

Objetiva-se investigar relações entre qualidade percebida no serviço educacional dos alunos de graduação presencial privada com: tamanho da turma, gênero e tempo de experiência de uso do serviço. Realizou-se pesquisa do tipo *survey*, de natureza quantitativa e caráter descritivo. A escala SERVPERF foi adaptada para mensurar as variáveis propostas sobre amostra de 1.379 estudantes de três instituições de ensino superior (IES) privadas brasileiras. Resultados do teste Mann-Whitney U indicaram relações negativas significativas entre qualidade percebida e tamanho da turma. As percepções de qualidade dos alunos veteranos também apresentaram resultados significativamente inferiores às percepções dos calouros. Por outro lado, apesar das médias do grupo feminino serem superiores às do grupo masculino em todas dimensões pesquisadas, não foi encontrado resultado significativo entre qualidade percebida e gênero, de forma geral. Devido às lacunas em pesquisas com as variáveis avaliadas, os achados contribuem para debate acadêmico, sobretudo acerca do comportamento do consumidor. Adicionalmente, discutem-se sugestões relevantes para tomadas de decisões gerenciais das IES que buscam melhorias operacionais e financeiras e se encontram pressionadas por tendências mercadológicas, incluindo aumento de alunos por sala de aula e consequente risco de deterioração da qualidade percebida de seus serviços.

**Palavras-chave:** Qualidade Percebida. Experiência de Uso. Gênero. SERVPERF. Tamanho da Turma.

## **1 INTRODUCTION**

The current adverse economic environment and the challenging Higher Education competitive landscape in Brazil have strongly impacted the local Higher Education Institutions (HEI). For instance, total on-campus enrollment decreased approximately 7% between 2015 and 2018 (INEP, 2019). Moreover, private HEIs' revenues have also been affected: (i) by decreases in the average student ticket from both on-campus (-6%) and online (-20%) programs, and; (ii) by a revenue-mix pressure as the online programs (with lower average tickets compared to those from similar on-campus programs) keep increasing their overall share of private HEIs' total enrolled population, moving from 21% in 2015 to 30% in 2018 (HOPER, 2018).

The private higher education sector, both in Brazil and in the world, is impacted by increasing levels of internal competition and market pressures, such as greater global competition and reduced operational budgets, and by the search for competitive advantages in a competitive environment that is still very fragmented (PEDRO; MENDES; LOURENÇO, 2018; LIM; JEE; DE RUN, 2020). Sector data, obtained in the reports of SEMESP (2016), the Union of Maintainers of Higher Education, and in the INEP's Synopses Statistics (INEP, 2019), indicate a 7% growth in the number of existing HEIs between 2015 and 2018. Such increase was accompanied by even greater growth in the offer of programs, which went from 33,501 in 2015 to 37,962 in 2018 (+ 13%). As a result, in 2018, 13.5 million new undergraduate seats were offered in Brazil, of which only 1/4 were filled (INEP, 2019).

More recent events, such as the current economic crisis from the COVID-19 pandemic, may increase the pressure on Brazilian HEIs, including a negative impact on the entry of new students and growth in default. The structural weaknesses of developing countries, such as their low technological accessibility and more fragile institutional environments, should escalate such pressures. In response, local HEIs will have to anticipate the implementation of their long-term strategic plans to face the more challenging post-pandemic business environments that will undoubtedly come (WITZE, 2020).

Consequently, these current and future challenges require private HEIs to seek market-related solutions, focusing on the quality of their services to improve their financial and operational results (TEEROOVENGADUM et al., 2019). The closer observance and control of constructs associated with students' attitudes towards the provided services, such as their perceived quality (PQ), can help HEIs search for competitive advantages and performance

improvements. In turn, improvements in PQ can generate potential positive impacts on revenue, since PQ is associated with attributes that can supply customers' needs, enabling the achievement of premium prices (ZEITHAML; PARASURAMAN; BERRY, 1990). Oliver (2015) suggests that, especially in challenging business situations, companies should focus on improving the satisfaction and quality of their services, which would boost their customers' repurchase and recommendation intentions and, consequently, the companies' own financial results. The positive relationship between PQ and constructs related to consumer attitudes, such as satisfaction, loyalty, intention to recommend, and between these with the financial performance of companies, is recognized by several studies in different manufacturing and service industries (SORESCU; SORESCU, 2016; YE; DONG; LEE, 2017)

Studies related to educational services also point out the relevance of the quality management for private HEIs (MANATOS; SARRICO; ROSA, 2017; PEIXOTO; AGUIAR, 2018) and the need to seek improvements in this area to increase PQ and other relevant consumption constructs, such as satisfaction, repurchase intention, recommendation, among others (PEDRO; MENDES; LOURENÇO, 2018; GUIMARÃES et al., TEEROOVENGADUM et al., 2019). Besides, operational and regulatory requirements for the Higher Education segment in Brazil, based on assessments of official bodies (e.g., INEP), require minimum service quality levels. Such assessments can also affect the financial performance of HEIs, both indirectly, with impacts on their images, and directly, with effects on the provision of public financing, for example.

The broader understanding of the relationship between some variables and students' PQ can generate relevant information for HEIs in their strategic and operational decision processes and, therefore, increases the value of the findings of this research. We aim to improve the general understanding of the relationship between students' PQ and the following variables: (i) class size; (ii) gender of the students and (iii) experience of use (EOU).

Our study can help HEIs in their strategic decisions of resource allocation while also increasing the currently scarce marketing literature concerned with the Higher Education segment and its related consumption constructs/variables, especially searching for a better understanding of the relationship between perceived quality and class size (WESTERLUND, 2008; BANDIERA; LARCINESE; RASUL, 2010).

## **2 THEORETICAL FRAMEWORK**

### **2.1 THE PERCEIVED QUALITY OF SERVICES**

Quality has been an important source of debate since the beginning of the 20th century, whereas its management (i.e., quality management) has already been integrated into the operational reality of an increasing number of organizations in the 21st century (MANATOS; SARRICO; ROSA, 2017). Prakash (2019) considers that the theme continues to evolve, including overlapping phases of conceptualization, expansion and revisions, while Pedro, Mendes and Lourenço (2018) also suggest that there are still measurement and definition challenges associated with the PQ debate. In this regard, specific industries, such as the higher education sector, remain in the initial stage of understanding and defining the relevance and use of PQ (TEEROOVENGADUM et al., 2019).

The initial works related to the concept of quality, in general, have already pointed out the need to include the individual perceptions of consumers in the use of the purchased item. Garvin (2002), for example, mentions the transcendent character and the association with consumer perception and satisfaction as some characteristics of the concept of quality. The "humanistic" values used in such conceptualizations (i.e., those derived from subjective, relativistic and individual responses) are closely related to the concept of perceived quality. Zeithaml (1988) disassociates the concept of PQ from the ones that are closer to objectivity, suggesting that PQ is a more abstract judgment of the consumer about the superiority or general excellence of a product or service.

Parasuraman, Zeithaml and Berry (1988) reinforce this nature of consumer's attitude and judgment in the PQ assessment. The confrontation of consumers' perceptions and expectations during the service consumption would generate the result of PQ. Additionally, this same perceived quality is supposed to be directly associated with the conscious and unconscious evaluation of perceptions from previous experiences, alternatives, criteria or expectations of consumers (CASTLEBERRY; McINTYRE, 1992).

Cronin and Taylor (1992) suggest, however, that PQ should be seen as an attitude, capable of being understood and measured through the "adequacy-importance" model, that is, when the attitude of each individual is defined by the performance evaluation of the service, according to his or her individual perceptions of importance.

The efficient management of customers' perceptions of quality by the institutions can become a relevant direct or indirect source of competitive advantages and improvements in

other consumer attitudes and the companies' financial performance, especially in dynamic and competitive business environments (CHEN; LIU, 2019). Thus, private HEIs should not refrain from searching for a better understanding of their students' perceptions of the quality of their services (SUMAEDI et al., 2012; PEIXOTO; AGUIAR, 2018).

## 2.2 CLASS SIZE

The concept of class size in higher education is mainly associated with a pedagogical/educational nature. In this regard, academic studies usually discuss the didactic impact of classes with many students, focusing on objective quality items, such as students' academic performance. Diverse studies point out several obstacles to the implementation of efficient didactic processes in classes with many students, such as the greater difficulty of interaction between teachers and students (VIEIRA-SANTOS; HENKLAIN, 2017), the decrease in student motivation, the use of lesser effective learning processes, the lower teaching sensitivity to students' problems (FOLEY; MANSIGLIA, 2014), and the difficulty of the use of active and less traditional methodologies (WRIGHT; BERGOM; BARTHOLOMEW, 2019). Interestingly, however, there has been no evidence of clear conceptual definitions of "class size" or even attempts to segment them into quantities of students in such studies.

From a marketing perspective (i.e., from studies on consumer behavior in higher education), the focus on quality falls, above all, on its impact on students' academic performance. In these works, class size is usually defined as the number of students enrolled and apt for the final exam in each discipline (MACHADO; VERA-HERNANDEZ, 2008; BANDIERA; LARCINESE; RASUL, 2010; ANNEGUES; PORTO; FIGUEIREDO, 2020), or as the number of students attending each discipline (HUXLEY et al., 2018). Bandiera et al. (2010) understand that higher education has, due to the more autonomous nature of its didactic model, a higher volume of students per room compared to those from primary education. In their study, these authors define the class sizes according to the distribution of their sample population, ranging from small classes (up to 19 students) to large ones (above 104). Also using arbitrary criteria related to the sample of their research, Huxley et al. (2018) create a group of "classes that are small" as classes with up to nine attending students, while Westerlund (2008) used only two different levels, classifying classes with 200 as "small" and classes with 600 students as "big". Finally, Sapelli and Illanes (2016) arbitrarily proposed

splitting the different classes of their study into eight ranges with a determined increasing number of students in each one.

In Brazil, class size can also be associated with some regulatory measures. For example, the Educational National Council's ordinance from 2009 (CNE / CP Ordinance 10, 6/08/2009) stipulates a maximum number of 35 students per teacher in Higher Education. In addition, the Brazilian Ministry of Education (MEC) has been proposing a variety of distinct individual limits of students per class in authorizing new programs. In this regard, Peixoto and Aguiar (2018), for example, adopted a limit of 50 students, based on legal opinions and injunctions, to divide their research sample between large and small classes.

### 2.3 GENDER

Gender is a widely researched variable in several fields of study, such as Psychology and Marketing, including a long tradition of investigating gender differences in consumer research. In consumer studies, the gender's differences may impact many distinct aspects, such as the desired objects, the process of decision-making, the use of a couple's shared resources (FERBER; LEE, 1974), and the individual processing of information related to consumption (MEYERS-LEVY; MAHESWARAN, 1991). In general, it is understood that gender may have a potential impact on purchasing attitudes. Such differences can be found in several stages of the purchase process, such as (i) in the definition of objectives (MITCHEL; WALSH, 2004; KWUN, 2011); (ii) in message processing (MEYERS-LEVY; MAHESWARAN, 1991); and (iii) in the decision-making process (MITCHEL; WALSH, 2004); among others.

The concept of PQ is directly associated with several purchase stages, including the formation of expectations that guide the purchase intention in the pre-sale, and the attitudes during and after the purchase, through evaluations of the performance of the goods or services consumed. Additionally, PQ has the potential to impact other post-purchase attitudes, such as the recommendation and repurchase intentions (CRONIN; BRADY; HULT, 2000). Therefore, companies must strive to better understand the factors that impact their consumers' PQ to improve their sales efficiency. In this sense, several empirical studies have assessed the potential impact of gender on the perception of quality of different services, attesting the potential significance of the consumer's gender in such perceptions (SPATHIS; PETRIDOU; GLAVELI, 2004; MOKHLIS, 2012).

Despite the importance of the theme, only a few studies have tried to understand the impact of the student's gender on the perception of the quality of services from private HEIs, especially in Brazil. Among these studies, there has been a tendency to validate the existence of differences in students' PQ according to their gender (SUMAEDI et al., 2012; ÇERA et al., 2018; KAUR; BHALLA, 2018), in line with the more general conceptual assumptions about gender in the consumer research.

#### 2.4 EXPERIENCE OF USE (EOU)

The time of experience in the use (EOU) of a product or service can also influence the consumer's satisfaction and perceived quality (BOLTON; DREW, 1991). Holbrook and Gardner (1993) suggest that the duration of use also affects the emotional components of consumption. For example, in the case of information systems, continuous usage leads to changes in users' perceptions and attitudes, generating a positive relationship between EOU and consumer loyalty (ZHANG et al., 2017). Consequently, this fact appears to have a potential impact on maintaining the consumption of the item or service.

Based on studies in Psychology, such as the "opinion adjustment model" from Hogart and Einhorn (1992), EOU can also affect consumers' perceptions of quality due to the variability existing in the multiple interactions using a service over time. This variability of interactions also includes factors such as the order of events (e.g., more recent negative experiences tend to have a greater impact on perceptions than similar older experiences) and the duration of each incident during the diverse interactions between the consumer and the service provider (GUSE et al., 2017).

In long-term and constant services, such as higher education, the control and understanding of the process of continually adjusting customer expectations (i.e., the frequent updating of expectations generated by interactions with the provider) is a critical mediating factor between satisfaction and student loyalty (PHAM; LAI, 2016). Some empirical studies suggest the potential impact of EOU on students' perceptions, such as the deterioration of perceptions of second-year students about some aspects related to their program in a British public HEI (WEBB; COTTON, 2019), or perceptions of more negative quality of senior students, when compared to the perceptions of incoming students (POFFO; MARINHO, 2013).



### 3 RESEARCH MODEL AND HYPOTHESES

The perceived quality of services is an attitude that can be captured with performance evaluations during and after consumption (CRONIN; TAYLOR, 1992; BRADY; CRONIN; BRAND, 2002). Several factors can influence the results of PQ. This work aims to assess the significance of the relationship among three different variables and PQ in Brazil's private higher education service.

Academic studies in education point to a negative relationship between class size and the quality of teaching (FOLEY; MANSIGLIA, 2014; VIEIRA-SANTOS; HENKLAIN, 2017; WRIGHT; BERGOM; BARTHOLOMEW, 2019). Studies from renowned independent institutes (e.g., Hanover Research Institute; 2010) also suggest that larger classes negatively affect the quality of the education. In addition, important international HEI's quality rankings, such as the "*Times Higher Education [THE]*", the "*The Guardian University Guide*" and the "*QS World University Rankings*", postulate that indicators linked to higher levels of "students per teacher" are negative for the educational quality offered by HEIs.

On the other hand, there is still a gap in empirical studies aimed at proving this potential negative relationship between class size and the service quality of HEIs (ANNEGUES; PORTO; FIGUEIREDO, 2020). This study searched the academic production (2000-2020) of papers related to the subject "class size and quality in Higher Education" in the following databases: Web of Science (WoS), Google Scholar, and SPELL, which is the database of the National Association of Graduate Studies and Research in Administration – ANPAD. We initially used the following words and their variations to select the related articles: quality, perceived quality, higher education, post-secondary education and university. Afterward, the terms class size, room size, and the number of students were included. Among the selected articles, the priority was given only to those written in English, Portuguese or Spanish and published in major-impact journals, categorized with Qualis-Periodicals B2, B1, A2 or A1 for Brazilian articles and with JCR or H-Index indexes for international papers.

In Higher Education, most studies evaluate the impact of class size on the quality of the service only from the perspective of students' academic performance and not from a perspective of the perceived quality of services. Even considering the service quality as just a matter of students' performance, the results from the impact of class size on this qualitative concept remain inconclusive (MIRANDA et al., 2015). One of the most cited potential causes for the inconsistencies of these findings is the presence of exogenous factors in teacher and

student allocation among classes in HEIs' programs (DE PAOLA; PONZO; SCOPPA, 2013; ANNEGUES; PORTO; FIGUEIREDO, 2020).

Alternatively, but to a lesser extent, some studies (e.g., Mandel and Süßmuth, 2011; and Sapelli and Illanes, 2016) sought to analyze the impact of class size on certain students' perceptions and attitudes, suggesting a favorable trend on the part of students for smaller classes. However, only a few studies focused on analyzing the relationship between class size and students' PQ. Westerlund (2008) evaluated the perception of students from a Swedish HEI on some qualitative variables and suggests that class size has a significant negative impact on the perceived quality of these students. However, the perceived quality construct was defined in a more general way without using previously tested scales. In addition to this work, only one other empirical study relating class size and perceived quality of students was found in our literature review. Peixoto and Aguiar (2018) researched with 201 first-year students in four subjects from a private Brazilian HEI and found a negative relationship between PQ and class size

Despite the small number of empirical studies, our study relies on the pedagogical concept to test the following hypothesis: ***the increase in class size is negatively related to the perception of the service quality in Brazilian private HEIs (Hypothesis 1).***

The gender of the consumer is a variable widely used in empirical research and has a significant potential impact on the attitudes of service and product purchasing (MEYERS-LEVY; MAHESWARAN, 1991; MITCHEL; WALSH, 2004; KWUN, 2011), including on the perceived quality. However, the relationship between demographic variables and students' perceptions has not been one of the main focuses of the empirical research in the Higher Education segment yet (SUMAEDI et al., 2012). Even so, there is a certain tendency to suggest the existence of differences, according to the gender of the students, in the students' PQ and satisfaction (KAUR; BHALLA, 2018), quality in general (ÇERA et al., 2018), or only in some of quality's dimensions (SUMAEDI et al., 2012).

Based on the theoretical debate and empirical studies, our study assumes, as a research hypothesis, that: ***the gender of the students is associated with the occurrence of significant differences in the perceived quality of the services in Brazilian private HEIs (Hypothesis 2).***

The time of experience in using a service, especially in services of a more continuous nature, influences the intensity of potential "disconfirmations" and, therefore, impacts also on the quality perceived by consumers (BOLTON; DREW; 1991; HOLBROOK; GARDNER,

1993; BOLTON, 1998). The face-to-face higher education service, by its very nature, presents a continuous relationship between the HEI and its students. Webb and Cotton (2019) evaluated the effect of the general decrease in students' academic performance in their second year at university. Together with the academic decline, the authors also observed significant reductions in students' perceptions of the pleasantness of their programs, increases in students' frustrations of their expectations, and students' higher intentions of evasion compared to first-year students. Therefore, our study assumes the conceptual hypothesis that: *the experience of use of the higher educational service generates significant differences in the perceived quality of the services in Brazilian private HEIs (Hypothesis 3).*

#### 4 METHODOLOGY

The nature of our research is quantitative and refers to the population formed by students of on-campus programs duly enrolled in the first academic semester of the year 2017 in three private Brazilian HEIs. These HEIs are located in three different states in the Brazilian Northeast and have great relevance regarding the total number of students in their cities. All HEIs offer a wide range of undergraduate programs, both on-campus and online. Their identities will be preserved, using "HEI 1", "HEI 2" and "HEI 3" to designate them in this study.

The sample selection process was non-probabilistic aimed at reflecting the total universe of the HEI population proportionally, both in terms of programs' and series' distribution. Unique answers per student were also planned within the sample selection process, i.e., since each student could be enrolled in more than one class, we avoid selecting classes that could repeat the use of a single respondent. Thus, data were collected from 61 classes, of varying sizes, including the smallest with eight students and the largest with 114 members, with 2,934 as the total number of students from these 61 classes.

The measurement of the perceived quality variable was centered on the SERVPREF scale (CRONIN; TAYLOR, 1992), widely used for evaluations of this construct in Marketing studies. Similar to Cronin and Taylor's (1992) research, our study used the revised SERVQUAL scale (PARASURAMAN; ZEITHAML; BERRY, 1991) as our starting point. This scale is comprised of 22 variables divided into five dimensions, as described in Table 1. Although Cronin and Taylor (1992) proposed the unidimensionality of the scale, the authors also admitted the possibility of using multiple dimensions to evaluate PQ, depending on the

service sector. In this regard, preliminary studies in the Higher Education segment show a significant potential for the reliability of the original dimensions of the SERVQUAL scale (PEIXOTO; AGUIAR, 2018). Therefore, our study will keep the five dimensions for the statistical analyses and further result analyses. Initially, the original scale was translated into Portuguese and then back-translated in English to guarantee its integrity.

**Table 1** SERVQUAL's Dimensions

Dimension	Definition / Scope
<b>Tangibles</b>	Physical facilities, equipment, and appearance of personnel
<b>Reliability</b>	Ability to perform the promised service in a dependent and accurate manner
<b>Responsiveness</b>	Desire to support and help customers and provide services promptly
<b>Assurance</b>	Employees' knowledge and courtesy plus their capacity of generating trust and confidence
<b>Empathy</b>	The individualized and careful attention given by the company to its customers

Source: adapted from Peixoto & Aguiar (2018).

In order to increase SERVPERF's adherence and predictability to our research's proposal, we searched for the adaptation of the original scale to the studied context (PARASURAMAN; ZEITHAML; BERRY, 1988); i.e., the scale adaptation to the reality of the Brazilian higher education segment first and, subsequently, to the specific environment of the three HEIs in which it was applied. As a first step, a bibliographic review of the use of SERVQUAL and SERVPERF in studies in national higher education was carried out. Next, together with the academic experts from the three HEIs, we evaluated the instrument to include terms and items relevant to the research context. The resulting first version was then submitted to a pre-test with 90 students from three different classes from one of the research's HEIs during the second semester of 2016. The results obtained were tested to confirm the dimensionality, reliability and validity of the variables and served as a source for the final scale's version used in the present study. As a consequence: (i) the instrument maintained its original five dimensions; (ii) one item/variable of the "Reliability" dimension was excluded due to its lack of adherence to the teaching service; (iii) three variables of the "Empathy" dimension were consolidated into one, to facilitate respondents' understanding; (iv) one variable was added to the "Empathy" dimension to reflect extra-class activities, something seen as important by the specialists in the field. Based on the procedures assumed by our research's design and on the results from the pre-test (e.g., the reliability tests' results and the minor changes performed over the original instrument), we assume that the integrity of the original scale was maintained.

As the final result of the analysis and verification of the scale, a questionnaire with 20 variables was generated, representing the five dimensions of PQ, all measured by a five-point Likert scale. Six questions about the sociodemographic and student nature were included too.

The study used a structured communication method, with the distribution of questionnaires to voluntary respondents who were aware of the research objectives, without benefits or penalties to the sample population. Higher education services are especially sensitive for the respondents (e.g., long-term nature, potentially impactful on the respondents' lives, among others) and the eventual lack of anonymity during the questionnaires' filling can cause constraints and fears of reprisals on the part of the respondents. Therefore, our procedures guaranteed total anonymity for the respondents, assuring more reliability to their answers.

Aiming to reduce the risks of behavioral bias and, at the same time, increase the data's solidity, we chose a critical moment for the application of surveys: one week before the final exams at the end of the semester cycle. This implies both that: (i) a solid relationship between "the consumer and the service consumed" had already occurred, and, (ii) there would be lower risks of contagion from the eventual results of academic approval or not of the students surveyed. The questionnaire was distributed and collected by employees of the HEIs, without intervention by the teacher of the evaluated discipline. The orientation for completing the questionnaire and the research objectives were communicated orally by the employees and in writing in the initial part of the questionnaire. The variables Gender and Time of Experience were collected in this same questionnaire. For the latter, "freshmen" were defined as students in the first or second semester of their programs and "senior students" as students enrolled from the third semester onwards.

In line with previous empirical studies, the number of students enrolled was considered as the class size. Such data were obtained with each participating HEI. According to the work of Peixoto and Aguiar (2018), our research considered 50 students as a limit for "small classes". Alternatively, "large classes" were identified as classes with more than 50 students.

## **5 RESULTS & DISCUSSION**

Although our research's methodological processes ensured the greatest possible reliability of the collection instrument, we performed additional tests to guarantee the

dimensionality and reliability of the proposed model. Before proceeding with such analyses, a database cleaning was performed, including the exclusion of incomplete or inadequate questionnaires. Additionally, the answers of five classes were entirely excluded due to the observance of inconsistencies in the collection processes. In the end, 90.5% of all received questionnaires were validated.

Based on the valid data, exploratory factor analysis was performed, confirming the proposed factor structure: the 20 variables were divided into the five original dimensions, with Kayser-Meyer-Olkin (KMO) measure equal to 0.969 and Bartlett's sphericity test significance at  $p < 0.001$  (approx. Chi-square = 19398.973 and  $df = 190$ ). The reliability of the five dimensions was also validated by their Cronbach's alphas ( $> 0.7$ ), as shown in Table 2.

**Table 2** Cronbach's alphas by dimensions of perceived quality

Dimension	Tangibles	Reliability	Respon.	Assurance	Empathy
<b>Cronbach's Alpha</b>	0.800	0.825	0.893	0.856	0.824

Source: the authors.

After excluding the inappropriate responses, a sample of 1,379 valid questionnaires was obtained from 56 different classes, distributed among 51 professors. The total valid response rate was 47.7%, ranging from 36.0% up to 60.7% by each individual HEI, as shown in Table 3.

**Table 3** Distribution of students (respondents), classes, and professors by HEI

Dimension	Nr. of Professors	Nr. of Classes	Total Sample Population	Valid Answers	% of Valid Answers
<b>HEI 1</b>	14	14	841	303	36.0%
<b>HEI 2</b>	18	21	907	380	41.9%
<b>HEI 3</b>	19	21	1,146	696	60.7%
<b>TOTAL</b>	51	56	2,894	1,379	47.7%

Source: the authors.

Regarding the age distribution, 37.1% of the respondents are up to 20 years old, 46.6% between 21 and 30 years old, 14.7% over 30 years old, and 1.5% did not answer. The number of students who claimed to have public financing (FIES) or public scholarship (PROUNI) is 29.8% and 11.9%, respectively. Regarding family income, 39.9% of the students report living with an average family income of up to R\$ 1,765.00, while 35.6% are in the range between R\$ 1,765.01 and R\$ 4,076.00. The group above R\$ 4,076.00 includes 18.2% of respondents,

with the remaining 6.3% preferring not to answer the question. It is worth mentioning that the socioeconomic and demographic profile reached in the sample is similar to the profile of the total population of the three HEIs in the survey, according to their own managers.

Associated with our research's variables, Table 4 depicts the split of respondents according to this research's hypotheses, including PQ's means and standard deviations.

**Table 4** Number of students by group of interest

Variable	Group	Nr of students	Mean of Perceived Quality	Standard deviation
<b>Class Size (H1)</b>	Classes up to 50 students	505	4.427	0.710
	Classes above 50 students	874	4.402	0.549
<b>Gender (H2)</b>	Male	664	4.385	0.643
	Female	715	4.436	0.582
<b>Time of Experience (H3)</b>	Freshman (1 <sup>st</sup> or 2 <sup>nd</sup> semester)	723	4.449	0.586
	Senior (3 <sup>rd</sup> to 10 <sup>th</sup> semester)	656	4.369	0.639

Source: the authors.

The preparation of each group of analysis followed its theoretical considerations, also respecting the characteristics of the target population of this research. Thus, students from the first and second semester classes were qualified as "freshmen", while the representatives of the other classes were qualified as "senior". Regarding gender, a limited possibility of two options was offered: male or female. Non-respondents were respected, and their responses were not included in our analyses. The Class Size variable used the criteria of 50 students as a limit for defining the division between classes, generating 33 classes with up to 50 students and 23 with more than 50 students.

Parasuraman, Zeithaml and Berry (1988) consider SERVQUAL as a scale that can serve as a management tool to assess the perceived quality of services provided through each dimension. The authors also suggest that each dimension can be measured by the mean of its variables. Additionally, they suggest that the mean of the five dimensions would serve as an assessment of the general perceived quality of the service. Therefore, our research assumes the mean of the 20 variables from the questionnaire as a proxy for PQ in all statistical tests after that, both for the general perception of the service and for the perceptions of each individual dimension.

Since the distribution of PQ, used as the dependent variable, was not normal (presenting  $p$ -value  $<0.001$  for the Kolmogorov-Smirnov, Shapiro-Wilk and Anderson-

Darling tests) and its variance between the different groups was not homogeneous, we decided to use non-parametric tests (Mann-Whitney U) to explore differences in PQ between the groups defined by the research hypotheses. The results about the mean differences between the groups are shown in Table 5.

**Table 5** Mann-Whitney U's results by research hypothesis

Hypothesis	<i>p</i> -valor
<b>H1:</b> the increase in class size is negatively related to the perception of the service quality in Brazilian private HEIs	0.001
<b>H2:</b> the gender of the students is associated with the occurrence of significant differences in the perceived quality of the services in Brazilian private HEIs	0.211
<b>H3:</b> the experience of use of the higher educational service generates significant differences in the perceived quality of the services in Brazilian private HEIs	0.025

Source: the authors.

According to the *p*-values (Table 5) and considering a significance level of 0.05, significant differences were found between the PQ of students in smaller and larger classes (H1) and between students with different EOU in higher education (H3). Concerning gender (H2), our findings do not provide sufficient evidence to indicate differences in the perception of quality, in general, between male and female students.

Although the mean of the 20 variables can represent the perceived quality of HEI services and answer the proposed study's questions, this research also aims to provide additional and helpful information for HEIs' management. In this regard, a more detailed analysis of each PQ individual dimension could offer subsidies for a better understanding of the potential sources of PQ's differences and, therefore, could support the HEIs in the strategic decisions of their resources' allocation.

The *p*-values in Table 6 show, with a significance level of 0.05, that the Tangibles dimension presents significant differences in PQ for different class sizes, and EOU, with no significant result for the student's gender. The Reliability dimension is significant only for the relationship PQ-EOU, while the Responsiveness and Empathy dimensions suggest the existence of significant differences in PQ only in relation to different sizes of the classes. Finally, the *p*-values of the Assurance dimension present significant differences for the relationships of PQ and class sizes, and PQ and the student's gender, with no significance for PQ-EOU.



**Table 6** Mann-Whitney U's results for each perceived quality's dimension

Variable	<i>p</i> -valor Total	<i>p</i> -valor Tangib.	<i>p</i> -valor Reliab.	<i>p</i> -valor Respons	<i>p</i> -valor Assur.	<i>p</i> -valor Empathy
Class Size (H1)	0.001	0.020	0.063	0.001	0.000	0,035
Gender (H2)	0.211	0.475	0.974	0.358	0.027	0,139
Experience of Use (H3)	0.025	0.002	0.003	0.059	0.248	0,156

Source: the authors.

## 5.1 DISCUSSION

The *p*-value of 0.001 (Table 5) of the Mann-Whitney U Test suggests the confirmation of Hypothesis 1, i.e., that the increase in class size is negatively related to the perception of the quality of the services in Brazilian private HEIs. Among the 56 classes from the three HEIs, the perceptions of the service quality from students in classes with more than 50 students are significantly smaller than in classes with up to 50 students.

Although several academic articles have already addressed the problems and challenges of education in large classes, the relationship between class size and perceived quality finds little statistical and theoretical evidence in research papers. Peixoto and Aguiar (2018) evaluated a sample of four classes and suggested the occurrence of a negative relationship between these variables. Our results are in line with these findings. Additionally, there is a significant negative relationship between these variables in four of the five dimensions of quality assessed. Only the Reliability dimension, with a *p*-value of 0.063, presents the possibility of similar perceptions of quality among students of different class sizes. The remaining four dimensions show significant differences in these perceptions and, together with the general PQ results, suggest that HEIs should pay general attention in almost all aspects of their services to students in classes with more than 50 enrolled students. This fact gains relevance since the low perception of quality can affect students' loyalty (ZEITHAML; PARASURAMAN; BERRY, 1990), increasing HEIs' challenges of retaining them.

Our results also validate Hypothesis 3, i.e., the experience of using the higher educational service generates significant differences in the perceived quality of the services in Brazilian private HEIs. The decline in perceptions of quality with the time of experience of students in higher education programs had already been pointed out by some studies, which suggested a gradual process of student demotivation (POFFO; MARINHO, 2013), the risk of negative impacts on future consumers' behavior towards the HEIs, and the decrease in

students' repurchase intentions of HEIs' services (TOMASSINI; AQUINO; CARVALHO, 2008).

Additionally, from the detailed analysis by PQ dimensions, the general decline in the "senior students" PQ can be dismembered and associated with specific factors and dimensions. Despite the fact that the PQ means of the "freshmen" group were higher than those of the "senior" group for all PQ dimensions, the results suggest the existence of statistically significant differences only in the Tangibles and Reliability dimensions. Therefore, the observance of these "detailed results" could assist HEIs in implementing more efficient mitigating actions to face the decline in the quality perceived by their students over time.

Finally, our results did not validate Hypothesis 2, suggesting that the gender of the students is not associated with the occurrence of significant differences in the perceived quality of the services. However, as in the case of the variable EOU, a more detailed analysis at a PQ dimension level can be used to provide some alternative and valuable insights for researchers and managers. In this regard, Sumaedi et al. (2012) and Joseph, Yakhou and Stone (2005) suggested the existence of possible differences between students' genders only for specific dimensions or items of PQ. Similar to their findings, our results point to a significant difference in only one dimension of the PQ construct, i.e., in the Assurance dimension, suggesting that the difference in students' gender may still be significant for specific items or dimensions of students' perceived quality.

## **6 CONCLUSION**

The main theoretical contributions of this study relate to our empirical analyses and findings associated with relevant social items, such as Higher Education, and with topics of the Marketing research, such as perceived quality and its relations with class size, gender, and experience of use. The dominant trend of implementing larger classes in the private on-campus higher education sector in Brazil poses risks to the quality of the services offered by the local HEIs and, consequently, also to their financial performance (ANNEGUES; PORTO; FIGUEIREDO, 2020). Even so, data and research on this trend and its impacts on services provided by HEIs are still scarce (HUXLEY et al., 2018). For the Higher Education segment, there is also a lack of studies on the relationship between students' PQ and the length of their experience of use and gender.

The coverage of such academic gaps and the other research findings also have a practical impact, as it allows a better orientation of the competitive strategy and a more efficient allocation of HEI's strategic and operational resources. This latter can further support HEIs in reducing risks and increasing opportunities for effective management of the quality of their services (MANATOS ; SARRICO; ROSA, 2017; KAUR; BHALLA, 2018). Our study's results suggest the existence of significant relationships between the quality perceived by the students and class size, experience of use, and gender (in PQ's Assurance dimension). These results should serve as an alert and guide the Brazilian private HEIs in the search for improvements in the provision of their services, given the potential impact of the perceived quality on other students' attitudes and, finally, on their own financial results (JOSEPH; YAKHOU; STONE, 2005; PEDRO; MENDES; LOURENÇO, 2018; GUIMARÃES et al ., 2019).

From the theoretical perspective, our findings support and promote the debate about the relationship of relevant consumers' variables and constructs, including: (i) the negative and still scarcely assessed relationship between perceived quality and class size, and; (ii) the negative relationship between perceived quality and experience of use. On the other hand, this study's findings also bring a need for a deeper understanding of the relationship between the students' gender and the perceived quality of the services. Despite the achieved non-significant result of the relationship between these two variables, our research suggests that this same relationship may have to be investigated from a more detailed perspective (i.e., based on the formative dimensions of PQ) in the private in-campus higher education segment.

From the managerial perspective and despite the impossibility of generalizations due to the study's scope, our findings can help the private HEIs promote internal strategic debates to search for solutions to the potential decline in the perception of quality of their students as they progress in their studies. The understanding of the process of continually adjusting students' expectations and creating more emotional and lasting ties with them should be a critical factor for long-term, relevant, and constant services, such as higher education (PHAM; LAI, 2016).

The HEIs should also seek to understand and manage their operational and strategic challenges, such as the trend of increasing students by class. The results of this study demonstrate the existence of lower perceptions of quality when services are offered in

classrooms of more than 50 students, thus generating a risk on the current and future performance of institutions in this sector.

In addition to the generalization limitation, this study also did not exclude the possibility of the impact of endogenous factors in the formation of the sample classes, i.e., the eventual non-random allocation of students, teachers and other resources may have influenced the results obtained. It is also worth noting the possibility of including individuals in groups other than their own, especially in the case of the split between "seniors" and "freshmen" who may be in different progression stages of their studies than those used in the research (e.g., an eventual "senior" student repeating a subject of the first two semesters of his/her academic program).

On the other hand, there is a vast field of possibilities for future research, especially due to the still scarce academic production in this area. The addition of other relevant constructs about consumer behavior (e.g., satisfaction, repurchase intention, and recommendation) and their eventual relationships with class size is still to be further explored. Such findings could add value not only to the academic debate but also to the management of the sector's institutions. Finally, equally relevant would be to improve the understanding of students' perception of quality, i.e., the better understanding of which variables and to what extent these variables can impact the perceived quality of services.

## REFERENCES

- ANNEGUES, C.A.; PORTO, S.; FIGUEIREDO, E. Tamanho da Turma e Desempenho Acadêmico dos Universitários: evidência para a UFPB. **Estudos Econômicos**, n.50, p. 99-124, 2020.
- BANDIERA, O.; LARCINESE, V.; RASUL, I. Heterogeneous Class Size Effects. **The Economic Journal**, n.120, p.1365-1398, 2010.
- BOLTON, R.N. A Dynamic Model of Duration of the Customer's Relationship with Continuous Service Provider: Role of Satisfaction. **Marketing Science**, n.17, p.45-65, 1998.
- BOLTON, R.N., DREW, J.H. A Longitudinal Analysis of the Impact of Service Changes on Customer Attitudes. **Journal of Marketing**, n. 55, v.1, p. 1-9, 1991.
- BRADY, M.K., CRONIN, J.J., BRAND, R.R. Performance-only measurement of service quality: a replication and extension. **Journal of Business Research**, v. 55, p. 17-31, 2002.
- CASTLEBERRY, S., & McINTYRE, F.S. Consumers' Quality Evaluation Process. **Journal of Applied Business Research**, 8(3), 74-82, 1992.

ÇERA, G.; CEPPEL, M.; ZAKUTNA, S.; ROSZA, Z. Gender differences in the perception of the university education quality as applied to entrepreneurial intention. **Journal of International Studies**, n. 11, v. 3, p. 147-160, 2018.

CHEN, C-M., LIU, H-M. The moderating effect of competitive status on the relationship between customer satisfaction and retention. **Total Quality Management & Business Excellence**, v. 30, p. 721-744, 2019.

CRONIN, J.J.; BRADY, M.K.; HULT, G.T.M. Assessing the Effects of Quality, Value, and Customer Satisfaction on Consumer Behavioral Intentions in Service Environments. **Journal of Retailing**, v. 76, n. 2, p. 193-218, 2000.

CRONIN, J.J.; TAYLOR, S.A. Measuring Service Quality: A Reexamination and Extension. **Journal of Marketing**, v. 56, n. 3, p. 55-68, 1992.

DE PAOLA, M.; PONZO, M.; SCOPPA, V. Class size effects on student achievement: heterogeneity across abilities and fields. **Education Economics**, v. 21, p. 135-153, 2013.

FERBER, R.; LEE, L.C. Husband-wife influence in family purchasing behavior. **Journal of Consumer Research**, v. 1, n.1, p. 43-50, 1974.

FOLEY, A.R.; MASINGILA, J.O. Building capacity: challenges and opportunities in large class pedagogy (LCP) in Sub-Saharan Africa. **Higher Education**, v. 67, p. 797-808, 2014.

GARVIN, D. A. **Gerenciando a Qualidade: a visão estratégica e competitiva**. Rio de Janeiro, Qualitymark, 2002

GUIMARÃES, J.C.F.; SEVERO, E.A.; NOBREGA, K.C.; LEONE, M.N.C.P.G. A influência da inovação no ensino, qualidade e comprometimento sobre a retenção de alunos no ensino superior. **Revista Gestão Universitária na América Latina**, v. 12, n. 1, p. 249-269, 2019.

GUSE, D.; WEISS, B.; HAASE, F.; WUNDERLICH, A.; MÖLLER, S. Multi-episodic perceived quality for one session of consecutive usage episodes with a speech telephony service. **Quality User Experience**, v. 2, n. 8, p. 1-16, 2017.

HANOVER RESEARCH INSTITUTE. **Strategies for Teaching Large Undergraduate Classes**. Washington, 2010.

HOGART, R.M.; EINHORN, H.J. Order effects in belief updating: the Belief-Adjustment model. **Cognitive Psychology**, v. 24, p. 1-55, 1992.

HOLBROOK, M.B., GARDNER, M.P. An Approach to Investigating the Emotional Determinants of Consumption Durations: Why Do People Consume What They Consume for as Long as They Consume It? **Journal of Consumer Psychology**, v. 2, p. 123-142, 1993.

HOPER – EDUCAÇÃO. **Análise Setorial da Educação Superior Privada** (11. ed.), 2018.

HUXLEY, G.; MAYO, J.; PEACEY, M.W.; RICHARDSON, M. Class Size at University. **Fiscal Studies**, v. 39, n. 2, p. 241-264, 2018.

INEP. **Sinopse Estatística da Educação Superior 2011 a 2018**. [online], 2012 a 2019. [citado 02/10/2019]. Disponível em: <http://portal.inep.gov.br/basica-censo-escolar-sinopse-sinopse>.

JOSEPH, M.; YAKHOU, M.; STONE, G. An education institution's quest for service quality: customers' perspective. **Quality Assurance in Education**, v. 13, n. 1, p. 66-82, 2005.

KAUR, H.; BHALLA, G.S. Determinants of effectiveness in public higher education-students' viewpoint. **International Journal of Educational Management**, v.32, p. 1135-1155, 2018.

KWUN, D.J. Effects of campus foodservice attributes on perceived value, satisfaction, and consumer attitude: A gender-difference approach. **International Journal of Hospitality Management**, v. 30, p. 252-261, 2011.

LIM, W.M.; JEE, T.W.; DE RUN, E.C. Strategic brand management for higher education institutions with graduate degree programs: empirical insights from the higher education marketing mix. **Journal of Strategic Marketing**, v. 28, n. 3, p. 225-245, 2020.

MACHADO, M.P.; VERA-HERNANDEZ, M. Does Class Size Affect the Academic Performance of First Year College Students? **Mimeo University College London**, 2008.

MANATOS, M.J.; SARRICO, C.S.; ROSA, M.J. The integration of quality management in higher education institutions: a systematic literature review. **Total Quality Management & Business Excellence**, v. 28, n. 1-2, p. 159-175, 2017.

MANDEL, P.; SÜSSMUTH, B. Size matters. The relevance and Hicksian surplus of preferred class size. **Economics of Education Review**, v. 30, p. 1073-1084, 2011.

MEYERS-LEVY, J.; MAHESWARAN, D. Exploring differences in Males' and Females' processing strategies, **Journal of Consumer Research**, v. 18, p. 63-70, 1991.

MIRANDA, G.J.; LEMOS, K.C.S.; OLIVEIRA, A.S.; FERREIRA, M.A. Determinantes do Desempenho Acadêmico na Área de Negócios. **Meta:Avaliação**, v. 7, p. 175-209, 2015.

MITCHELL, V.; WALSH, G. Gender differences in German consumer decision-making styles. **Journal of Consumer Behaviour**, v. 3, p. 331-346, 2004.

MOKHLIS, S. The Influence of Service Quality on Satisfaction: A Gender Comparison. **Public Administration Research**, v.1, n. 1, p. 103-112, 2012.

OLIVER, R.L. **Satisfaction: a behavioral perspective on the consumer** (2. Ed). New York, Routledge, 2015.

PARASURAMAN, A.; ZEITHAML, V.A.; BERRY, L.L. SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perceptions of Service Quality. **Journal of Retailing**, v. 64, n. 1, p. 12-40, 1988.

PARASURAMAN, A.; ZEITHAML, V.A.; BERRY, L.L. Refinement and Reassessment of the SERVQUAL Scale. **Journal of Retailing**, v. 67, n. 4, p. 420-450, 1991.

PEDRO, E.; MENDES, L.; LOURENÇO, L. Perceived service quality and students' satisfaction in higher education: the influence of teaching methods. **International Journal for Quality Research**, v. 12, n. 1, p. 165-192, 2018.

PEIXOTO, M.R.; AGUIAR, E.C. O Impacto do Tamanho da Classe na Percepção de Qualidade de Alunos de uma Instituição de Ensino Superior Privada Brasileira. **Revista Gestão e Planejamento**, v. 19, p. 191-207, 2018.

PHAM, H-H; LAI, S.L. Higher education as an extended duration service: an investigation of the determinants of Vietnamese overseas student loyalty. **Journal of Studies in International Education**, v. 20, n. 5, p. 454-471, 2016.

POFFO, G.D.; MARINHO, S.V. Qualidade na percepção discente do curso de administração. **Revista Gestão Universitária na América Latina**, v. 6, n. 2, p. 210-230, 2013.

PRAKASH, G. Understanding service quality: insights from the literature. **Journal of Advances in Management Research**, v. 16, n. 1, p. 64-90, 2019.

SAPELLI, C.; ILLANES, G. Class size and teacher effects in higher education. **Economics of Education Review**, v. 52, p. 19-28, 2016.

SEMESP - Sindicato das Mantenedoras de Ensino Superior. **Mapa do ensino superior no Brasil 2016**. São Paulo, Convergência, 2016.

SORESCU, A.; SORESCU, S.M. Customer satisfaction and long-term stock returns. **Journal of Marketing**, v. 80, p. 110-115, 2016.

SPATHIS, C.; PETRIDOU, E.; GLAVELI, N. Managing Service Quality in Banks: customer's gender effects. **Managing Service Quality**, v. 14, p. 90-102, 2004.

SUMAEDI, S.; MAHATMA, G.; BAKTI, Y.; METASARI, N. An empirical study of state university students' perceived service quality. **Quality Assurance in Education**, v. 20, p. 164-183, 2012.

TEEROOVENGADUM, V.; NUNKOO, R.; GRÖNROOS, C.; KAMALANABHAN, T.J.; SEEBALUCK, A.K. Higher education service quality, student satisfaction and loyalty. Validating the HESQUAL scale and testing an improved structural model. **Quality Assurance in Education**, v. 27, n. 4, p. 427-445, 2019.

TOMASSINI, R.; AQUINO, R.; CARVALHO, F.A. Expectativas e percepções em sequencias de serviços. **RAE Eletrônica**, v. 7, n. 2, 2008.

VIEIRA-SANTOS, J.; HENKLAIN, M.H.O. Contingências sociais que dificultam o engajamento do professor universitário em relações de qualidade com seus alunos. **Revista Perspectivas**, v. 8, n. 2, p. 200-214, 2017.

WEBB, O.J.; COTTON, D.R.E. Deciphering the sophomore slump: changes to student perceptions during the undergraduate journey. **Higher Education**, v. 77, p. 173-190, 2019.

WESTERLUND, J. Class size and student evaluations in Sweden. **Education Economics**, v. 16, n. 1, p. 19-28, 2008.

WITZE, A. Universities will never be the same after the coronavirus crisis. **Nature**, v. 582, p. 162-164, 2020.

WRIGHT, M.C.; BERGOM, I.; BARTHOLOMEW, T. Decreased class size, increased active learning? **Active Learning in Higher Education**, v. 20, n. 1, p. 51-62, 2019.

YE, J.; DONG, B.; LEE, J-Y. The long-term impact of service empathy and responsiveness on customer satisfaction and profitability: a longitudinal investigation in a healthcare context. **Marketing Letters**, v. 28, p. 551-564, 2017.

ZEITHAML, V.A. Consumer Perception of Price, Quality, and Value: A Means-End Model and Synthesis of Evidence. **Journal of Marketing**, v. 52, n. 3, p. 2-22, 1988.

ZEITHAML, V.A.; PARASURAMAN, A.; BERRY, L.L. **Delivering Quality Service: Balancing Customer Perceptions and Expectations**. New York, The Free Press, 1990.